RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Log Event A

Borehole # 60-11-03

Borehole Information

Farm : U	**Tank :** U-111	**Site Number :** 299-W18-102
N-Coord : 37,901	**W-Coord :** 75,686	**TOC Elevation :** 666.05
Water Level, ft :	**Date Drilled :** 7/31/1973	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 125	

Borehole Notes:
This borehole was drilled in July 1973 and completed with 6-in., schedule-40 steel tubing with a wall thickness of 0.280 in. to a depth of 125 ft below the original ground surface. The drill rig was set up and drilled 4 ft, and then the rig was moved 1 ft north and the hole was completed there. There is a 2.5 ft concrete wall running north-south between tanks U-111 and U-110. Apparently 3 ft of casing was welded to the top of the original casing, and the area between this wall and tank U-110 was filled in to the level of the top of the wall. The top of the borehole casing is 0.7 ft above this elevated surface. The SGLS was able to reach a depth of 128.5 ft. There is no mention in the drilling log about the casing being perforated or any mention of cement placed in the bottom of the hole.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 11/27/1995	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 18.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 12/1/1995	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 17.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 79.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 3	**Log Run Date :** 12/4/1995	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 128.5	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 78.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : E.P. Baumgartner

Data Processing Reference : P-GJPO-1787 Analysis Date : 6/12/1996

Analysis Notes :

The logging of this borehole was completed in three runs using the Spectral Gamma Logging System (SGLS). The pre- and post-field verification spectra indicate that the logging system was operating properly during data collection. The energy/channel drift observed during the logging runs remained within the defined acceptance range for the search parameters used by the processing software. Therefore, multiple energy calibrations were not required to process the data. The monitored portions of the verification spectra indicated no deterioration in the efficiency of the detector. Data overlaps, where the same depth intervals were logged during different log runs, occurred at 17 and 78 ft. The calculated concentrations at the overlap log sections were within the statistical uncertainty of the measurements, indicating acceptable repeatability.

The top of the casing is 0.7 ft above the current ground surface and approximately 3 ft above the original ground surface at the time the borehole was drilled. The ground surface surrounding this borehole is 2.5 ft above the rest of the ground surface around tank U-111.

Man-made radionuclides Cs-137, Eu-154, and Co-60 were detected in significant concentrations near the top of the borehole. The center of the peak was at 3.5 ft with concentrations of 525 pCi/g for Cs-137, approximately 100 pCi/g for Eu-154, and 11 pCi/g for Co-60. Weak concentrations (less than 1 pCi/g) of Cs-137 occur between depths of 16.5 to 22 ft, and between 127.0 and 128.5 ft.

Details regarding the interpretation of the data for this borehole are presented in the Tank Summary Data Report for tank U-111.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (K-40, U-238, and Th-232). The natural radionuclides can be used for lithologic interpretations. The headings of these plots identify the energy of the specific gamma peaks used to calculate the concentrations.

A combination plot includes the man-made radionuclides, the naturally occurring radionclides, the total gamma count derived from the SGLS and the Westinghouse Hanford Company (WHC) Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data from WHC with no attempt to adjust the depths to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainty for the calculated concentrations at the 95-percent confidence level. The minimum detection level (MDL) is shown by open circles on the plots. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.